



10-Channel Universal Temperature Measurement IC Linearizes Sensors to 0.1°C Conformity

MILPITAS, CA – September 7, 2016 – Linear Technology Corporation introduces the [LTC2986](#) high performance digital temperature measurement IC, which directly digitizes any combination of thermocouples, RTDs, thermistors and external diodes with 0.1°C conformity and 0.001°C resolution. The LTC2986 builds on the award-winning LTC2983 and LTC2984 by adding three new operating modes and reducing the number of analog inputs from 20 channels to 10 channels. The new operating modes provide better support for external overvoltage protection resistors that are shared between multiple sensor types, powered temperature sensors with analog outputs, and other non-temperature related sensors such as pressure or other voltage output sensors.

The LTC2986's high performance analog front end combines low noise and low offset buffered ADCs with all the necessary excitation and control circuits for each sensor. Measurements are performed under the control of a digital engine, combining all the algorithms and linearization required for each. The device precisely measures absolute microvolt level signals from thermocouples and ratiometric resistance measurements from RTDs and thermistors, performs the linearization and outputs the results in °C or °F. Up to ten analog inputs are available, allowing support for up to nine thermocouples, four RTDs, four thermistors and/or ten diodes. The SPI interface works with virtually any digital system and a comprehensive software support system with drop-down menus allows easy customization of the LTC2986.

The simple, yet feature-rich, LTC2986 interfaces with a wide variety of temperature sensors, including type B, E, J, K, N, S, R, T thermocouples, 2-, 3- or 4-wire RTDs, 2.25kΩ to 30kΩ thermistors and temperature sensing diodes. The LTC2986 works with ground-referenced sensors without the need of amplifiers, negative supplies or level shift circuitry. Signals are simultaneously digitized with three, high accuracy, 24-bit $\Delta\Sigma$ ADCs using an internal 15ppm/°C reference. Automatic thermocouple cold junction compensation is accomplished using any type of external sensor. Included on the chip are linearization algorithms for all common sensor types.

Custom sensors can be linearized with custom coefficients, programmed and stored in the chip. Onboard EEPROM (LTC2986-1) is used to store user configuration data and custom sensor coefficients, eliminating any IC or sensor programming by a host processor. Dual programmable excitation current sources feature current reversal and current ranging to improve accuracy and reduce noise. To ensure resistive measurements are accurate, current reversal eliminates thermocouple effects in the resistive sensor. Sensor-specific fault detection alerts the user of short-circuits, open-circuits, overtemperature, undertemperature and ADC overranging.

The LTC2986 is offered in commercial, industrial and automotive versions, supporting operating temperature ranges from 0°C to 70°C, -40°C to 85°C and respectively, -40°C to 125°C. The LTC2986 is now available in a RoHS compliant, 7mm x 7mm LQFP-48 package, and is pin-compatible with the LTC2983 and LTC2984. Pricing starts at \$16.56 each in 1,000 piece quantities. For more information, visit www.linear.com/product/LTC2986.

Photo Caption: Complete 10-Channel Digital Temperature Measurement SoC


Summary of Features: LTC2986

- Directly Digitize RTDs, Thermocouples, Thermistors & Diodes
- Single 2.85V to 5.25V Supply
- 10 Flexible Inputs Allow Multiple Sensor Types
- Automatic Thermocouple Cold Junction Compensation
- Standard & User-Programmable Coefficients for Linearizing Thermocouples, RTDs & Thermistors
- Configurable 2-, 3-, 4-Wire RTD Configurations
- Measures Negative Thermocouple Voltages without a Negative Supply
- On-Chip EEPROM Stores Channel Configuration Data & Custom Coefficients (LTC2986-1)
- Automatic Burn Out, Short-Circuit & Fault Detection
- Buffered Inputs Allow External Protection & Direct Interface to Resistive Sensors
- Simultaneous 50Hz/60Hz Rejection
- Includes 15ppm/°C (Max) Reference
- 48-Lead 7mm x 7mm LQFP Package
- Pin & Software Compatible with LTC2983/LTC2984

Pricing shown is for budgetary use only and may differ due to local duties, taxes, fees and exchange rates.

About Linear Technology

Linear Technology Corporation, a member of the S&P 500, has been designing, manufacturing and marketing a broad line of high performance analog integrated circuits for major companies worldwide for over three decades. The Company's products provide an essential bridge between our analog world and the digital electronics in communications, networking, industrial, automotive, computer, medical, instrumentation, consumer, and military and aerospace systems. Linear Technology produces power management, data conversion, signal conditioning, RF and interface ICs, μ Module[®] subsystems, and wireless sensor network products. For more information, visit www.linear.com

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